SUPERO®

H8QM3-2+
H8QMi-2+

USER'S MANUAL

Revision 1.0a

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Preface

About This Manual

This manual is written for system integrators, PC technicians and knowledgeable PC users. It provides information for the installation and use of the H8QM3-2+/H8QMi-2+ serverboard. The H8QM3-2+/H8QMi-2+ is based on the nVidia® MCP55 Pro chipset and supports four AMD Opteron Socket F type 8000 series processors and up to 128 GB of DDR2-667 registered ECC SDRAM.

Please refer to the serverboard specifications pages on our web site for updates on supported processors (http://www.supermicro.com/aplus/). This product is intended to be professionally installed.

Manual Organization

Chapter 1 includes a checklist of what should be included in your serverboard box, describes the features, specifications and performance of the serverboard and provides detailed information about the chipset.

Chapter 2 begins with instructions on handling static-sensitive devices. Read this chapter when installing the processor(s) and memory modules and when installing the serverboard in a chassis. Also refer to this chapter to connect the floppy and hard disk drives, the parallel and serial ports, the mouse and keyboard and the twisted wires for the power and reset buttons and the system LEDs.

If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for the video, the memory and the setup configuration stored in CMOS. For quick reference, a general FAQ (Frequently Asked Questions) section is provided. Instructions are also included for contacting technical support. In addition, you can visit our web site for more detailed information.

Chapter 4 includes an introduction to BIOS and provides detailed information on running the CMOS Setup utility.

Appendix A provides BIOS POST Checkpoint Codes.

Appendix B lists BIOS Error Beep Code Messages.

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Appendix A BIOS Error Beep Codes

Appendix B BIOS POST Checkpoint Codes

Chapter 1

Introduction

1-1 Overview

Checklist

Congratulations on purchasing your computer serverboard from an acknowledged leader in the industry. Our boards are designed with the utmost attention to detail to provide you with the highest standards in quality and performance.

Please check that the following items have all been included with your serverboard. If anything listed here is damaged or missing, contact your retailer.

Included with retail box only

- One (1) H8QM3-2+/H8QMi-2+ serverboard
- One (1) IDE cable (CBL-036L-03)
- One (1) floppy cable (CBL-022L)
- One (1) COM port cable (CBL-010L)
- Eight (8) SATA cables (CBL-044L), H8QM3-2+ only
- Six (6) SATA cables (CBL-044L), H8QMi-2+ only
- One (1) I/O shield (CSE-PT55L)
- One (1) CD containing drivers and utilities

1-2 Contacting Supermicro

Headquarters

Address:	Super Micro Computer, Inc.
	980 Rock Ave.
	San Jose, CA 95131 U.S.A.
Tel:	+1 (408) 503-8000
Fax:	+1 (408) 503-8008
Email:	marketing@supermicro.com (General Information)
	support@supermicro.com (Technical Support)
Web Site:	www.supermicro.com

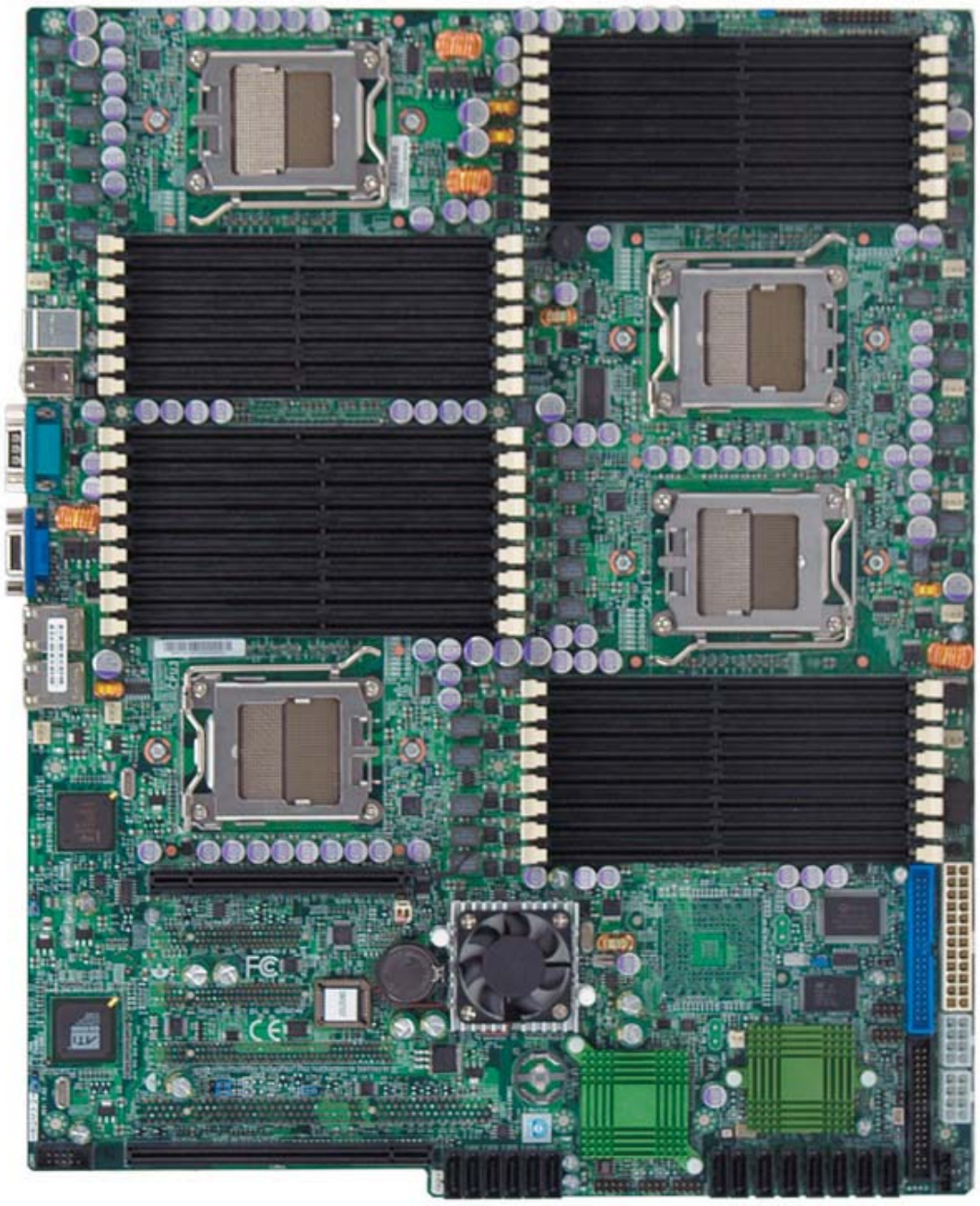
Europe

Address:	Super Micro Computer B.V.
	Het Sterrenbeeld 28, 5215 ML
	's-Hertogenbosch, The Netherlands
Tel:	+31 (0) 73-6400390
Fax:	+31 (0) 73-6416525
Email:	sales@supermicro.nl (General Information)
	support@supermicro.nl (Technical Support)
	rma@supermicro.nl (Customer Support)

Asia-Pacific

Address:	Super Micro, Taiwan
	4F, No. 232-1, Liancheng Rd.
	Chung-Ho 235, Taipei County
	Taiwan, R.O.C.
Tel:	+886-(2) 8226-3990
Fax:	+886-(2) 8226-3991
Web Site:	www.supermicro.com.tw
Technical Support:	
Email:	support@supermicro.com.tw
Tel:	886-2-8228-1366, ext.132 or 139

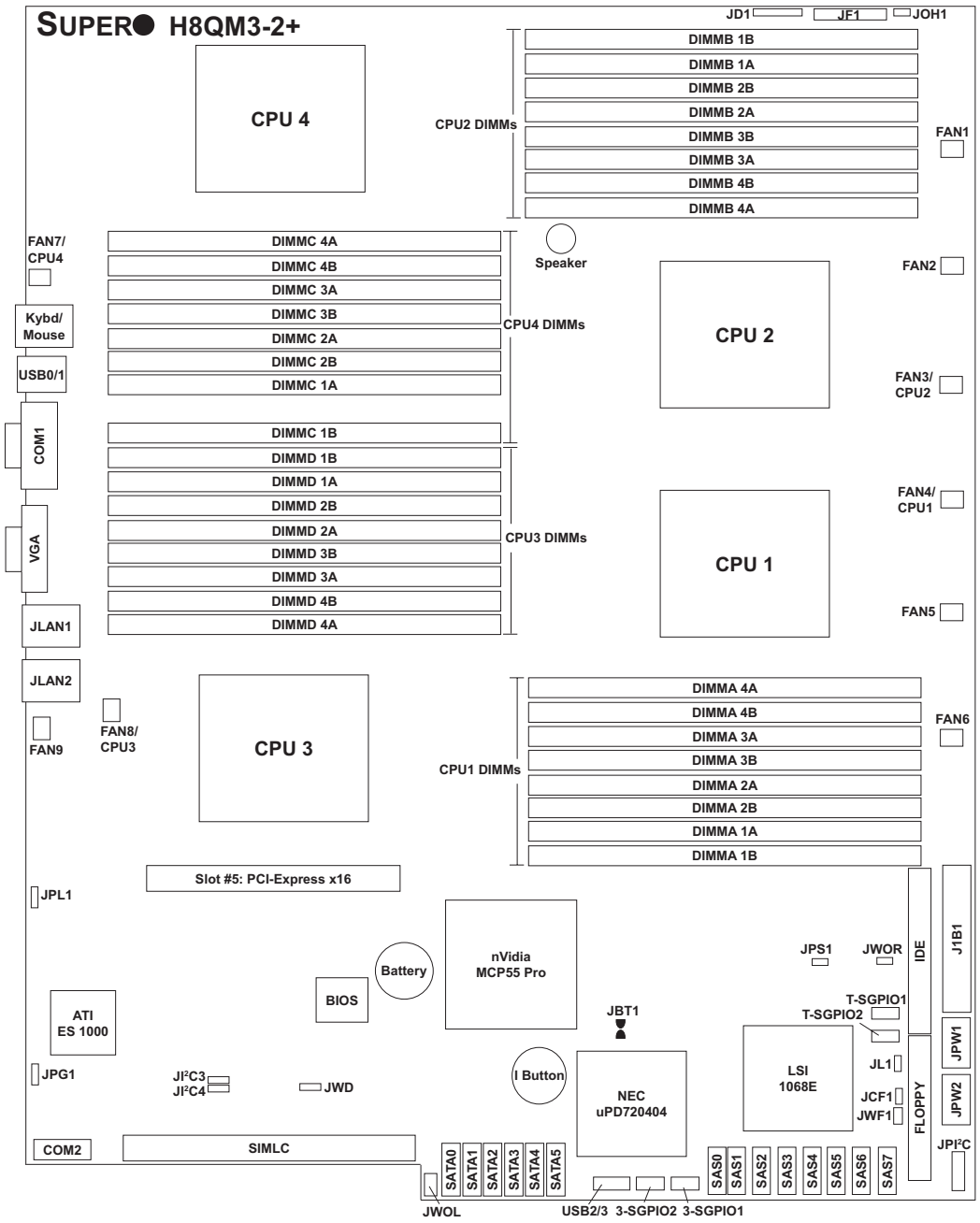
Figure 1-1. H8QM3-2+ Image



Note: the H8QMi-2+ has the same layout but does not include SAS ports or components.

1-3 Serverboard Details

Figure 1-2. Serverboard Layout
(not drawn to scale)



Notes: Jumpers not indicated are for test purposes only. The H8QMi-2+ has the same layout as the H8QM3-2+ but does not include SAS ports or components.

H8QM3-2+/H8QMi-2+ Quick Reference

Jumper	Description	Default Setting
JBT1	CMOS Clear	(See Section 2-7)
JCF1	Compact Flash Card Master/Slave	Closed (Master)
JPS1*	SAS RAID Select	Closed (SR RAID)
JI²C3/JI²C4	I²C to PCI-E	Pins 2-3 (Disabled)
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JPL1	JLAN Enable/Disable	Pins 1-2 (Enabled)
JWD	Watch Dog	Pins 1-2 (Reset)

Connector	Description
3-SGPIO1/3-SGPIO2*	SGPIO Headers (used with SAS)
COM1/COM2	COM1 Serial Port/Header
FAN 1-9	Chassis/CPU Fan Headers
Floppy	Floppy Disk Drive Connector
I Button*	I Button (for RAID 5 support)
IDE	IDE Drive/Compact Flash Card Connector
J1B1	24-Pin ATX Power Connector
JD1	Onboard Speaker/Power LED
JF1	Front Panel Connector
JL1	Chassis Intrusion Header
JLAN1/2	Gigabit Ethernet (RJ45) Ports
JOH1	Overheat Warning Header
JPI²C	I²C Header
JPW1/JPW2	8-Pin Processor Power Connectors
JWF1	Compact Flash Card Power Connector
JWOL	Wake-On-LAN Header
JWOR	Wake-On-Ring Header
SAS0 ~ SAS7*	Serial Attached SCSI (SAS) Ports
SATA0 ~ 5	Serial ATA (SATA) Ports
T-SGPIO1/T-SGPIO2	SGPIO Headers (used with SATA)
SIMLC	IPMI 2.0 (with virtual media over LAN) Slot
USB0/1	Universal Serial Bus (USB) Ports
USB2/3	USB Headers

*H8QM3-2+ only

Serverboard Features

CPU

- Two (dual) or four (quad) AMD Opteron 8000 series Socket F type processors
- See web site for details on supported processors

Memory

- Thirty-two dual-channel DIMM slots supporting up to 128 GB of registered ECC DDR2-667/533/400 SDRAM
- Refer to Section 2-4 before installing.

Chipset

- nVidia MCP55 Pro

Expansion Slots

- One (1) PCI-Express x16 slot
- One (1) SIMLC slot (for IPMI card)

BIOS

- 8 Mb AMIBIOS® LPC Flash ROM
- DMI 2.3, PCI 2.2, ACPI 2.0, SMBIOS 2.3, Plug and Play (PnP)

PC Health Monitoring

- Onboard voltage monitors for four CPU cores, Hyper Transport (1.2V), memory banks (1.8V), chipset (1.5V)
- Fan status monitor with firmware/software on/off and speed control
- Watch Dog
- Environmental temperature monitoring via BIOS
- Power-up mode control for recovery from AC power loss
- System resource alert (via included utility program)
- Auto-switching voltage regulator for the CPU core

ACPI Features

- Slow blinking LED for suspend state indicator
- BIOS support for USB keyboard
- Main switch override mechanism
- Internal/external modem ring-on

Onboard I/O

- On-chip SATA controller supporting six (6) 3 Gb/s SATA ports (RAID 0, 1, 0+1, 5 and JBOD)
- LSI 1068E SAS controller supporting eight (8) SAS ports (RAID 0, 1, 10 and JBOD, optional RAID 5 support with iButton installed) (H8QM3-2+ only)
- One (1) UltraDMA (ATA) 133/100 IDE port
- One (1) floppy port interface
- Two (2) Fast UART 16550 compatible serial ports
- On-chip (Intel 82546) Ethernet controller supports two Gb Ethernet ports
- PS/2 mouse and PS/2 keyboard ports
- Four (4) USB (Universal Serial Bus) 2.0 ports/headers
- ATI ES1000 graphics chip

Other

- Wake-on-Ring (JWOR)
- Wake-on-LAN (JWOL)
- Chassis intrusion detection

Dimensions

- Extended ATX form factor
- 16.4" x 13" (417 x 330 mm)

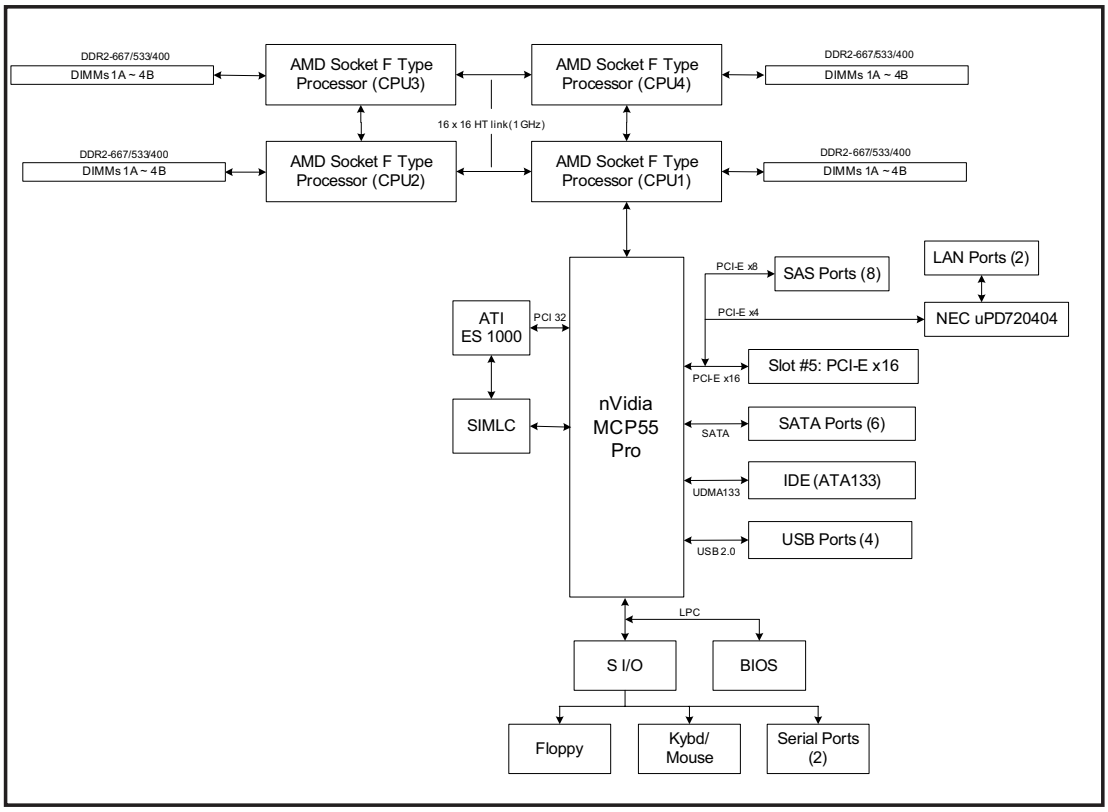


Figure 1-3. nVidia MCP55 Pro Chipset: System Block Diagram

Note: This is a general block diagram and may not exactly represent the features on your serverboard. See the previous pages for the actual specifications of your serverboard.

1-4 Chipset Overview

The H8QM3-2+/H8QMi-2+ serverboard is based on the nVidia MCP55 Pro chipset. The MCP55 Pro functions as Media and Communications Processor (MCP). An NEC uPD720404 chip is also included as a bridge for the GB LAN ports. Note that the controllers for the system memory are integrated directly into the AMD CPUs.

MCP55 Pro Media and Communications Processor

The MCP55 Pro is a single-chip, high-performance HyperTransport peripheral controller. It includes a 28-lane PCI Express interface, an AMD Opteron 16-bit Hyper Transport interface link, a six-port (3 Gb/s) Serial ATA interface, an ATA133 bus master interface and a USB 2.0 interface. This hub connects directly to CPU1.

NEC uPD720404

This I/O bridge chip provides one PCI-Express x4 upstream port and two PCI-X domains. Each bridge supports PCI masters that include clock, request and grant signals. This hub links the MCP55 with the Gb LAN ports.

HyperTransport Technology

HyperTransport technology is a high-speed, low latency point to point link that was designed to increase the communication speed by a factor of up to 48x between integrated circuits. This is done partly by reducing the number of buses in the chipset to reduce bottlenecks and by enabling a more efficient use of memory in multi-processor systems. The end result is a significant increase in bandwidth within the chipset.

1-5 PC Health Monitoring

This section describes the PC health monitoring features of the H8QM3-2+/H8QMi-2+. The serverboard has an onboard System Hardware Monitor chip that supports PC health monitoring.

Onboard Voltage Monitors for four CPU cores, Hyper Transport (1.2V), memory (1.8V), chipset (1.5V)

The onboard voltage monitor will scan these voltages continuously. Once a voltage becomes unstable, it will give a warning or send an error message to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor. Real time readings of these voltage levels are all displayed in BIOS.

Fan Status Monitor with Firmware/Software Speed Control

The PC health monitor can check the RPM status of the cooling fans. The onboard fans are controlled by thermal management via BIOS.

CPU Overheat/Fan Fail LED and Control

This feature is available when the user enables the CPU overheat/Fan Fail warning function in the BIOS. This allows the user to define an overheat temperature. When this temperature is exceeded or when a fan failure occurs, then, the Overheat/Fan Fail warning LED is triggered.

Auto-Switching Voltage Regulator for the CPU Core

The 5-phase-switching voltage regulator for the CPU core can support up to 100A and auto-sense voltage IDs. This will allow the regulator to run cooler and thus make the system more stable.

1-6 Power Configuration Settings

This section describes the features of your serverboard that deal with power and power settings.

Microsoft OnNow

The OnNow design initiative is a comprehensive, system-wide approach to system and device power control. OnNow is a term for a PC that is always on but appears to be off and responds immediately to user or other requests.

Slow Blinking LED for Suspend-State Indicator

When the CPU goes into a suspend state, the chassis power LED will start blinking to indicate that the CPU is in suspend mode. When the user presses any key, the CPU will wake-up and the LED will automatically stop blinking and remain on.

BIOS Support for USB Keyboard

If a USB keyboard is the only keyboard in the system, it will function like a normal keyboard during system boot-up.

Main Switch Override Mechanism

When an ATX power supply is used, the power button can function as a system suspend button. When the user depresses the power button, the system will enter a SoftOff state. The monitor will be suspended and the hard drive will spin down. Depressing the power button again will cause the whole system to wake-up. During the SoftOff state, the ATX power supply provides power to keep the required circuitry in the system alive. In case the system malfunctions and you want to turn off the power, just depress and hold the power button for 4 seconds. The power will turn off and no power will be provided to the serverboard.

Wake-On-LAN

Wake-On-LAN is defined as the ability of a management application to remotely power up a computer that is powered off. Remote PC setup, up-dates and access tracking can occur after hours and on weekends so that daily LAN traffic is kept to a minimum and users are not interrupted. The serverboard has a 3-pin header (JWOL) to connect to the 3-pin header on a Network Interface Card (NIC) that has WOL capability. Wake-On-LAN must be enabled in BIOS. Note that Wake-On-LAN can only be used with an ATX 2.01 (or above) compliant power supply.

Wake-On-Ring Header

Wake-up events can be triggered by a device such as the external modem ringing when the system is in the SoftOff state. Note that external modem ring-on can only be used with an ATX 2.01 (or above) compliant power supply.

1-7 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates.

The H8QM3-2+/H8QMi-2+ accommodates 12V ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. A 2 amp current supply on a 5V Standby rail is strongly recommended.

It is strongly recommended that you use a high quality power supply that meets 12V ATX power supply Specification 1.1 or above. Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

Warning: To prevent the possibility of explosion, do not use the wrong type of onboard CMOS battery or install it upside down.

1-8 Super I/O

The disk drive adapter functions of the Super I/O chip include a floppy disk drive controller that is compatible with industry standard 82077/765, a data separator, write pre-compensation circuitry, decode logic, data rate selection, a clock generator, drive interface control logic and interrupt and DMA logic. The wide range of functions integrated onto the Super I/O greatly reduces the number of components required for interfacing with floppy disk drives. The Super I/O supports two 360 K, 720 K, 1.2 M, 1.44 M or 2.88 M disk drives and data transfer rates of 250 Kb/s, 500 Kb/s or 1 Mb/s.

It also provides two high-speed, 16550 compatible serial communication ports (UARTs), one of which supports serial infrared communication. Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.

The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through a SMI or SCI function pin. It also features auto power management to reduce power consumption.

The IRQs, DMAs and I/O space resources of the Super I/O can be flexibly adjusted to meet ISA PnP requirements, which support ACPI and APM (Advanced Power Management).

Chapter 2

Installation

2-1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to your system board, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.
- Use only the correct type of CMOS onboard battery as specified by the manufacturer. Do not install the CMOS onboard battery upside down, which may result in a possible explosion.

Unpacking

The serverboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

Installation Procedure

Perform the following procedures in the order listed below to install the serverboard into a chassis:

1. Install the processor(s) and the heat sink(s).
2. Install the serverboard in the chassis.
3. Install the memory and add-on cards.
4. Finally, connect the cables and install the drivers.

Exercise extreme caution when handling and installing the processor. Always connect the power cord last and always remove it before adding, removing or changing any hardware components.

2-2 Processor and Heat Sink Installation

CPU Backplates

Four CPU backplates (BKT-0011L) have been preinstalled to the serverboard to prevent the CPU area of the serverboard from bending and to provide a base for attaching the heat sink retention modules.

Single, dual or quad-CPU configurations only are supported. For a single-CPU configuration, install to the CPU1 socket. For a dual-CPU configuration, install to the CPU1 and CPU2 sockets.

Installing Processors

1. Begin by removing the cover plate that protects the CPU. Lift the lever on the CPU socket until it points straight up. With the lever raised, lift open the silver CPU retention plate.

2. Use your thumb and your index finger to hold the CPU. Locate and align pin 1 of the CPU socket with pin 1 of the CPU. Both are marked with a triangle.

3. Align pin 1 of the CPU with pin 1 of the socket. Once aligned, carefully place the CPU into the socket. *Do not drop the CPU on the socket, move the CPU horizontally or vertically or rub the CPU against the socket or against any pins of the socket, which may damage the CPU and/or the socket*.

4. With the CPU inserted into the socket, inspect the four corners of the CPU to make sure that it is properly installed and flush with the socket. Then, gently lower the silver CPU retention plate into place.

5. Carefully press the CPU socket lever down until it locks into its retention tab. For a dual-CPU system, repeat these steps to install another CPU into the CPU#2 socket (and into CPU#2, #3 and #4 sockets for a quad-CPU configuration).

Note: in single and dual-CPU configurations, memory must be installed in the DIMM slots associated with the installed CPU(s) and is limited to a maximum of 64 and 32 GB, respectively.

2-3 Mounting the Serverboard into a Chassis

All serverboards have standard mounting holes to fit different types of chassis. Ensure that the locations of all the mounting holes for both the serverboard and the chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground the serverboard to the chassis. Make sure that the metal standoffs click in or are screwed in tightly.

Check the Compatibility of the Serverboard Ports and the I/O Shield

The H8QM3-2+/H8QMi-2+ serverboard requires a chassis that can support extended ATX boards of 16" x 13" in size. Make sure that the I/O ports on the serverboard align with their respective openings in the I/O shield at the rear of the chassis.

Mounting the Serverboard into the Chassis

1. Carefully align the serverboard mounting holes with the raised metal standoffs in the serverboard tray.

2. Insert screws into all the mounting holes in the serverboard that line up with the standoffs.

3. Use a screwdriver to tighten all screws until just snug (if too tight you might strip the threads).

2-4 Installing Memory

Exercise extreme care when installing or removing memory modules to prevent any possible damage.

Installing DIMMs

1. Insert each memory module vertically into its slot, paying attention to the notch(es) along the bottom of the module to prevent inserting the module incorrectly (see Figure 2-1). Insert first into the 1B slot(s), then the 1A slot(s), etc. See support information below.

2. Gently press down on the memory module until it snaps into place.

Note: Each processor has its own built-in memory controller, consequently each CPU has an eight-slot memory bank associated with it. (Memory installed into a bank with no CPU present cannot be accessed.) 256 MB, 512 MB, 1 GB, 2 GB and 4 GB memory modules are supported. It is highly recommended that you remove the power cord from the system before installing or changing DIMMs.

Support

The H8QM3-2+/H8QMi-2+ supports single or dual-channel, registered ECC DDR2-667/533/400 SDRAM.

Both interleaved and non-interleaved memory are supported, so you may populate any number of DIMM slots (see note on previous page). Populating two adjacent slots at a time with memory modules of the same size and type will result in interleaved (128-bit) memory, which is faster than non-interleaved (64-bit) memory.

Optimizing Memory Performance

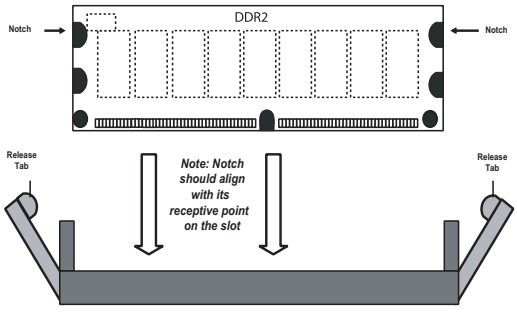
It's better to spread pairs of DIMMs across all memory banks that have a CPU installed than to fill up one CPU memory bank while leaving another empty. For example, if you were to install eight DIMMs in a quad-CPU configuration, you should install two in the CPU1 DIMM slots (slots 1A and 1B) , two in the CPU2 DIMM slots, two in the CPU3 DIMM slots and two in the CPU4 DIMM slots rather than four in any two CPU DIMM slots. If you install four more, install two in the remaining CPU1 DIMM slots and two in the the remaining CPU2 DIMM slots, etc. This balances the load over all CPUs to optimize performance. Note that memory can only be installed in banks associated with an installed CPU.

Maximum Memory

128 GB of DDR2-667/533/400. (Dual-CPU configuration: 64 GB maximum, single-CPU configuration: 32 GB maximum.)

Figure 2-1. Side and Top Views of DDR2 Installation

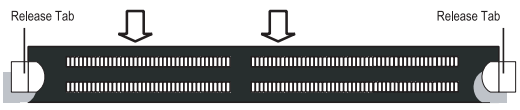
To Install:
Insert module vertically and press down until it snaps into place. The release tabs should close - if they do not you should close them yourself.



Note: the notch in the slot and on the bottom of the DIMM. These prevent the DIMM from being installed incorrectly.

To Remove:
Use your thumbs to gently push each release tab outward to release the DIMM from the slot.

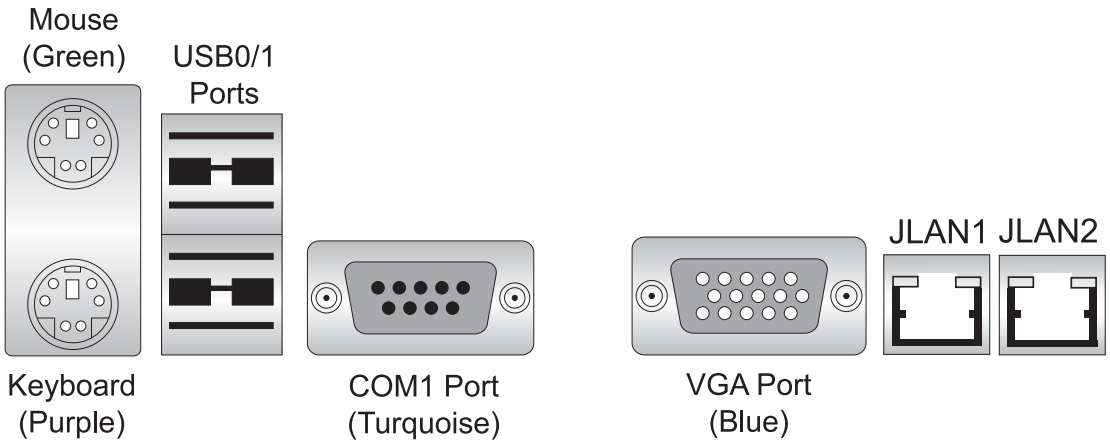
Top View of DDR2 Slot



2-5 I/O Port and Control Panel Connections

The I/O ports are color coded in conformance with the PC99 specification to make setting up your system easier. See Figure 2-2 below for the colors and locations of the various I/O ports.

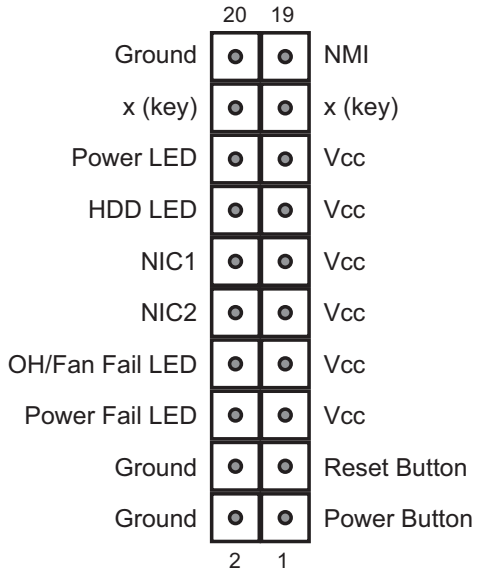
Figure 2-2. I/O Port Locations and Definitions



Front Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 2-3 for the pin definitions of the various connectors. Refer to Section 2-6 for details.

Figure 2-3. Front Control Panel Header (JF1)



2-6 Connector Definitions

ATX Power Connector

The primary ATX power supply connector (J1B1) meets the SSI (Superset ATX) 24-pin specification. Refer to the table on the right for the pin definitions of the ATX 24-pin power connector. This connection supplies power to the chipset, fans and memory.

Note: You must also connect the 8-pin JPW1 and JPW2 power connectors to your power supply (see below).

ATX Power 24-pin Connector Pin Definitions (J1B1)

Pin#	Definition	Pin #	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

Processor Power Connectors

In addition to the primary ATX power connector (above), the 8-pin processor power connectors at JPW1 and JPW2 must also be connected to your power supply. See the table on the right for pin definitions.

Processor Power Connector 1 Pin Definitions (JPW1, JPW2)

Pins	Definition
1 through 4	Ground
5 through 8	+12V

Required Connections

NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)

Pin#	Definition
19	Control
20	Ground

Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

Power LED Pin Definitions (JF1)

Pin#	Definition
15	Vcc
16	Control

HDD LED

The HDD (IDE Hard Disk Drive) LED connection is located on pins 13 and 14 of JF1. Attach the IDE hard drive LED cable to display disk activity. Refer to the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)

Pin#	Definition
13	Vcc
14	HD Active

NIC1 LED

The NIC1 (Network Interface Controller) LED connection is located on pins 11 and 12 of JF1. Attach the NIC1 LED cable to display network activity. Refer to the table on the right for pin definitions.

NIC1 LED Pin Definitions (JF1)

Pin#	Definition
11	Vcc
12	NIC1 Active

NIC2 LED

The NIC2 (Network Interface Controller) LED connection is located on pins 9 and 10 of JF1. Attach the NIC2 LED cable to display network activity. Refer to the table on the right for pin definitions.

NIC2 LED Pin Definitions (JF1)

Pin#	Definition
9	Vcc
10	NIC2 Active

Overheat/Fan Fail LED

Connect an LED to the OH connection on pins 7 and 8 of JF1 to provide advanced warning of chassis overheating. Refer to the table on the right for pin definitions and status indicators.

OH/Fan Fail LED Pin Definitions (JF1)

Pin#	Definition
7	Vcc
8	Control

OH/Fan Fail LED Status

State	Indication
Solid	Overheat
Blinking	Fan fail

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions. (Feature is only available with redundant power supply systems.)

Power Fail LED Pin Definitions (JF1)

Pin#	Definition
5	Vcc
6	Control

Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to the hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)

Pin#	Definition
3	Reset
4	Ground

Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (see the Power Button Mode setting in BIOS). To turn off the power when set to suspend mode, depress the button for at least 4 seconds. Refer to the table on the right for pin definitions.

Power Button Pin Definitions (JF1)

Pin#	Definition
1	PW_ON
2	Ground

Universal Serial Bus Ports (USB0/1)

Two Universal Serial Bus ports (USB2.0) are located beside the keyboard/mouse ports. See the table on the right for pin definitions.

Universal Serial Bus Ports Pin Definitions (USB0/1)

USB0		USB1	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground

USB Headers

Two additional USB2.0 headers (USB2/3) are included on the serverboard. These may be connected to provide front side access. A USB cable (not included) is needed for the connection. See the table on the right for pin definitions.

Universal Serial Bus Headers Pin Definitions (USB2/3)

USB2		USB3	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	Key	5	No connection

Serial Ports

The COM1 serial port is located beside the USB ports on the I/O backplane. COM2 is a header located near the SIMLC slot. Refer to the table on the right for pin definitions.

Serial Port Pin Definitions (COM1, COM2)

Pin #	Definition	Pin #	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

Note: NC indicates no connection.

Fan Headers

The serverboard has nine fan headers, which are designated FAN1 through FAN9. Fans speed may be set to full or variable speed with a BIOS setting. See the table on the right for pin definitions.

Note: when using active heatsinks, FAN4 is for CPU1, FAN3 is for CPU2, FAN7 is for CPU3 and FAN8 is for CPU4.

Fan Header Pin Definitions (FAN1-9)

Pin#	Definition
1	Ground (Black)
2	+12V/9V (Red)
3	Tachometer

Note: Fan speed may controlled by a BIOS setting to change with system temperature. As a result, pin 2 may be either 12V or 9V. See Chapter 4 for BIOS settings.

Overheat LED

Connect an LED to the JOH1 header to provide warning of chassis overheating. See the table on the right for pin definitions.

Overheat LED Pin Definitions (JOH1)

Pin#	Definition
1	+3.3V
2	OH Active

Power LED/Speaker

On the JD1 header, pins 1-3 are for a power LED, pins 4-7 are for the speaker. See the table on the right for speaker pin definitions. **Note**: The speaker connector pins are for use with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper.

Speaker Connector Pin Definitions (JD1)

Pin #	Function	Definition
4	+	Speaker data (red wire)
5	Key	No connection
6		Key
7		Speaker data

JLAN1/2 (Ethernet Ports)

Two Gigabit Ethernet ports (designated JLAN1 and JLAN2) are located beside the COM2 port. These Ethernet ports accept RJ45 type cables.

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse ports are located at J3. The mouse is the top (green) port. See the table on the right for pin definitions.

PS/2 Keyboard and Mouse Port Pin Definitions (J3)

Pin#	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

Chassis Intrusion

A Chassis Intrusion header is located at JL1. Attach the appropriate cable to inform you of a chassis intrusion.

Chassis Intrusion Pin Definitions (JL1)

Pin#	Definition
1	Intrusion Input
2	Ground

Wake-On-LAN

The Wake-On-LAN header is designated JWOL. See the table on the right for pin definitions. You must have a LAN card with a Wake-On-LAN connector and cable to use the Wake-On-LAN feature.

Wake-On-LAN Pin Definitions (JWOL)

Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up

I²C Header

The JPI²C header is for I²C, which may be used to monitor the status of the power supply. See the table on the right for pin definitions.

I²C Header (JPI²C) Pin Definitions

Pin#	Definition
1	Clock
2	SMB Data
3	N/A
4	N/A
5	N/A

Wake-On-Ring

The Wake-On-Ring header is designated JWOR. This function allows your computer to receive and "wake-up" by an incoming call to the modem when in suspend state. See the table on the right for pin definitions. You must have a Wake-On-Ring card and cable to use this feature.

Wake-On-Ring Pin Definitions (JWOR)

Pin#	Definition
1	Ground (Black)
2	Wake-up

Compact Flash Power Headers

A Compact Flash Card Power Connector is located at JWF1. For the Compact Flash Card to work properly, you will first need to connect the device's power cable to JWF1 and correctly set the Compact Flash Jumper (JP1).

Compact Flash Power Header Pin Definitions (JWF1)

Pin#	Definition
1	+5V
2	Ground
3	Signal

3-SGPIO1/3-SGPIO2

The 3-SGPIO1 and 3-SGPIO2 headers provide a bus between the SAS controller and the drive backplane to provide SAS enclosure management functions. Connect cables from the backplane to the these headers to utilize SAS management on your system.

SAS SGPIO Headers Pin Definitions (3-SGPIO1, 3-SGPIO2)

Pin#	Definition	Pin #	Definition
1	NC	2	NC
3	Ground	4	Data
5	Load	6	Ground
7	NC	8	NC

Notes: NC indicates no connection.

SGPIO = Serial General Purpose Input/Output

T-SGPIO1/T-SGPIO2

The T-SGPIO1 and T-SGPIO2 headers provide a bus between the SATA controller and the drive backplane to provide SATA enclosure management functions. Connect cables from the backplane to these headers to utilize SATA management on your system.

SATA SGPIO Headers Pin Definitions (T-SGPIO1, T-SGPIO2)

Pin#	Definition	Pin #	Definition
1	NC	2	NC
3	Ground	4	Data
5	Load	6	Ground
7	NC	8	NC

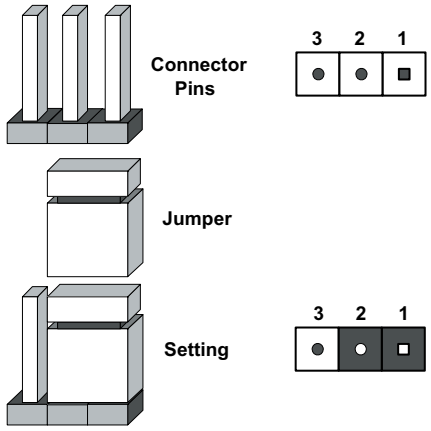
Notes: NC indicates no connection.

SGPIO = Serial General Purpose Input/Output

2-7 Jumper Settings

Explanation of Jumpers

To modify the operation of the serverboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the diagram at right for an example of jumping pins 1 and 2. Refer to the serverboard layout page for jumper locations.



Note: On two-pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

CMOS Clear

JBT1 is used to clear CMOS and will also clear any passwords. Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To clear CMOS

1. First power down the system and unplug the power cord(s).
2. With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver for at least four seconds.
3. Remove the screwdriver (or shorting device).
4. Reconnect the power cord(s) and power on the system.

Notes: *Do not use the PW_ON connector to clear CMOS*. The onboard battery does not need to be removed when clearing CMOS, however you must short JBT1 for at least four seconds.

JBT1 contact pads

VGA Enable/Disable

JPG1 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings (JPG1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

JLAN Enable/Disable

Change the setting of jumper JPL1 to enable or disable the JLAN1 and JLAN2 Gb Ethernet ports. See the table on the right for jumper settings. The default setting is enabled.

JLAN1/2 Enable/Disable Jumper Settings (JPL1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Compact Flash Master/ Slave

The JCF1 jumper allows you to assign either master or slave status to a compact flash card installed in the IDE#1 slot. You will need to connect compact flash power to JWF1 to use. See the table on the right for jumper settings.

Compact Flash Master/Slave Jumper Settings (JCF1)	
Jumper Setting	Definition
Closed	Master
Open	Slave

I²C to PCI-E Slots

Jumpers JI²C3 and JI²C4 allow you to connect the PCI-E slot to the I²C (System Management) bus. The default setting is disabled. Both jumpers must be set to the enabled or disabled setting for this feature to function. See the table on the right for jumper settings.

I²C to PCI-E Slot Jumper Settings (JI²C3, JI²C4)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

SAS RAID Select

JPS1 allows you to select between SR RAID, which is the default and enables SAS RAID, or IT RAID, which treats SAS drives as non-RAID drives and requires a firmware flash. See the table on the right for jumper settings and below for the IT firmware flash procedure.

SAS RAID Select Jumper Settings (JPS1)	
Jumper Setting	Definition
Open	IT RAID
Closed	SR RAID

Note: SR = Software RAID IT = Integrate Target mode

Flashing IT Firmware

1. Download the appropriate IT firmware from the web site: ftp://ftp.supermicro.com/driver/SAS/LSI/Firmware/IT/
2. Unzip it to a bootable floppy or USB pen.
3. With JPS1 on (closed) boot to the device with the unzipped firmware and type "clear" to erase the SR firmware.
4. Remove AC power and open JPS1.
5. Boot to the disk again and type "H8QM32".
6. When prompted for the SAS address, type in the 16-digit SAS address labeled on the board.
7. Power off the system before restarting.

Watch Dog Enable/Disable

JWD controls the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application hangs. Pins 1-2 will cause WD to reset the system if an application has frozen. Pins 2-3 will generate a non-maskable interrupt signal for the application that is hung up. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS (setting located in the Power Menu).

Watch Dog Jumper Settings (JWD)	
Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI

Note: When enabled, the user needs to write their own application software in order to disable the Watch Dog timer.

2-8 Onboard Indicators

LAN1/LAN2 LEDs

The Ethernet ports (located beside the VGA port) have two LEDs. On each Gb LAN port, one LED indicates activity when blinking while the other LED may be amber or off to indicate the speed of the connection. See the table on the right for the functions associated with the connection speed LED.

LAN LED (Connection Speed Indicator)	
LED Color	Definition
Off	10/100 MHz
Amber	1 GHz

Onboard Power LED (DP2)

DP2 is an Onboard Power LED. When this LED is lit, it means power is present on the serverboard. In suspend mode this LED will blink on and off. Be sure to turn off the system and unplug the power cord(s) before removing or installing components.

2-9 Floppy, IDE, SATA and SAS Drive Connections

Use the following information to connect the floppy and hard disk drive cables.

- The floppy disk drive cable has seven twisted wires.
- A red mark on a wire typically designates the location of pin 1.
- A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.
- The 80-wire ATA133 IDE hard disk drive cable that came with your system has two connectors to support two drives. This special cable should be used to take advantage of the speed this new technology offers. The blue connector connects to the onboard IDE connector interface and the other connector(s) to your hard drive(s). Consult the documentation that came with your disk drive for details on actual jumper locations and settings for the hard disk drive.

Floppy Connector

The floppy connector is located beside the IDE#1 connector. See the table on the right for pin definitions.

Floppy Drive Connector Pin Definitions (Floppy)

Pin#	Definition	Pin #	Definition
1	GND	2	FDHDIN
3	GND	4	Reserved
5	Key	6	FDEDIN
7	GND	8	Index-
9	GND	10	Motor Enable
11	GND	12	Drive Select B-
13	GND	14	Drive Select A-
15	GND	16	Motor Enable
17	GND	18	DIR-
19	GND	20	STEP-
21	GND	22	Write Data-
23	GND	24	Write Gate-
25	GND	26	Track 00-
27	GND	28	Write Protect-
29	GND	30	Read Data-
31	GND	32	Side 1 Select-
33	GND	34	Diskette

IDE Connector

There are no jumpers to configure the onboard IDE connector. See the table on the right for pin definitions.

IDE Drive Connector Pin Definitions (IDE)

Pin#	Definition	Pin #	Definition
1	Reset IDE	2	Ground
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	Ground	20	Key
21	DRQ3	22	Ground
23	I/O Write	24	Ground
25	I/O Read	26	Ground
27	IOCHRDY	28	BALE
29	DACK3	30	Ground
31	IRQ14	32	IOCS16
33	Addr1	34	Ground
35	Addr0	36	Addr2
37	Chip Select 0	38	Chip Select 1
39	Activity	40	Ground

SATA Ports

There are no jumpers to configure the SATA ports, which are designated SATA0 ~ SATA5. See the table on the right for pin definitions.

SATA Drive Port Pin Definitions (SATA0 ~ SATA5)

Pin #	Definition
1	Ground
2	TXP
3	TXN
4	Ground
5	RXN
6	RXP
7	Ground

SAS Ports

There are two SAS ports, one located on the backplane and the other on the serverboard near the floppy connector. See the table on the right for pin definitions.

Note: refer to the FAQ section in Chapter 3 for details on enabling SAS.

SAS Ports Pin Definitions (JSM1/JSM2)

Pin #	Definition
1	Ground
2	TXP
3	TXN
4	Ground
5	RXN
6	RXP
7	Ground

SIMLC (IPMI Slot)

The SIMLC slot on the H8QM3-2+ is reserved for an optional IPMI card.

2-10 Enabling SATA RAID

Note: For SAS RAID, please refer to LSI manual on the driver CD.

Serial ATA (SATA)

Serial ATA (SATA) is a physical storage interface that employs a single cable with a minimum of four wires to create a point-to-point connection between devices. This connection is a serial link. The serial cables used in SATA are thinner than the traditional cables used in Parallel ATA (PATA) and can extend up to one meter in length, compared to only 40 cm for PATA cables. Overall, SATA provides better functionality than PATA.

Installing the OS/SATA Driver

Before installing the OS (operating system) and SATA RAID driver, you must decide if you wish to have the operating system installed as part of a bootable RAID array or installed to a separate non-RAID hard drive. If on a separate drive, you may install the driver either during or after the OS installation. If you wish to have the OS on a SATA RAID array, you must follow the procedure below and install the driver during the OS installation.

Note: the SATA RAID driver is supported by Windows 2000 and XP only.

Creating a Driver Diskette

You must first create a driver diskette from the CD-ROM that was included with the system. You will have to create this disk on a computer that is already running and with the OS installed.

Creating the Driver Diskette

1. Insert the CD into your CD-ROM drive and start the system. A display as shown in Figure 2-6 will appear.

2. Click on the icon labeled "Build Driver Diskettes and Manuals" and follow the instructions to create a floppy disk with the driver on it.

3. Once it's been created, remove the floppy and insert the installation CD for the Windows Operating System you wish to install into the CD-ROM drive of the new system you are about to configure.

Enabling SATA RAID in the BIOS

Before installing the Windows Operating System, you must change some settings in BIOS. Boot up the system and hit the <Del> key to enter the BIOS Setup Utlility. After the Setup Utility loads, perform the following steps:

1. Use the arrow keys to move to the Exit menu. Scroll down with the arrow keys to the "Load Optimal Defaults setting and press <Enter>. Select "OK" to confirm, then <Enter> to load the default settings.

2. Use the arrow keys to move to the "Advanced" menu, then scroll down to "nVidia RAID Function" and press the <Enter> key. Use this setting to enable the RAID function. After enabling RAID, use the next setting to enable all drives you wish to include in the RAID array.

3. Hit the <F10> key to "Save Changes and Exit", then hit <Enter> to verify.

4. After exiting the BIOS Setup Utility, the system will reboot. When prompted during the startup, press the <F10> key when prompted to run the nVidia RAID Utility program.

Using the nVidia RAID Utility

The nVidia RAID Utility program is where you can define the drives you want to include in the RAID array and the mode and type of RAID. Two main windows are shown in the utility (see Figure 2-4).

Setting up a RAID Array

1. The "Free Disks" window on the left lists all available drives. Use the arrow keys to select and move drives to the window on the right, which lists all drives that are to become part of the RAID array.

2. Once you have finished selecting the drives and type of RAID you wish to use for your RAID array, press the <F7> key. You will be prompted to verify your choice; if you want to continue with your choices, select "Yes". Note that selecting "Yes" will clear all previous data from the drives you selected to be a part of the array.

3. You now have the choice of making the RAID array bootable by pressing the the <B> key.

4. After you have finshed, press the <Ctrl> and <X> keys simultaneously. Figure 2-5 shows a list of arrays that have been set up with the utility.

Installing the OS and Drivers

1. With the Windows OS installation CD in the CD-ROM drive, restart the system.

2. When you see the prompt, hit the <F6> key to enter Windows setup.

3. A blue screen will appear with a message that begins "Windows could not determine the type of one or more storage devices . . ." When you see this screen, hit the <S> key to "Specify Additional Device", then insert the driver diskette you just created into the floppy drive.

4. Highlight "Manufuacturer Supplied Hardware Support Disk" and hit the <Enter> key.

5. Highlight the first "nVidia RAID" driver shown and press the <Enter> key to install it.

6. Soon a similar blue screen will appear again. Again hit the <S> key, then highlight the second item, "nForce Storage Controller" and press the <Enter> key, then <Enter> again to continue with the Windows setup.

Figure 2-4. SATA RAID Utility: Main Screen

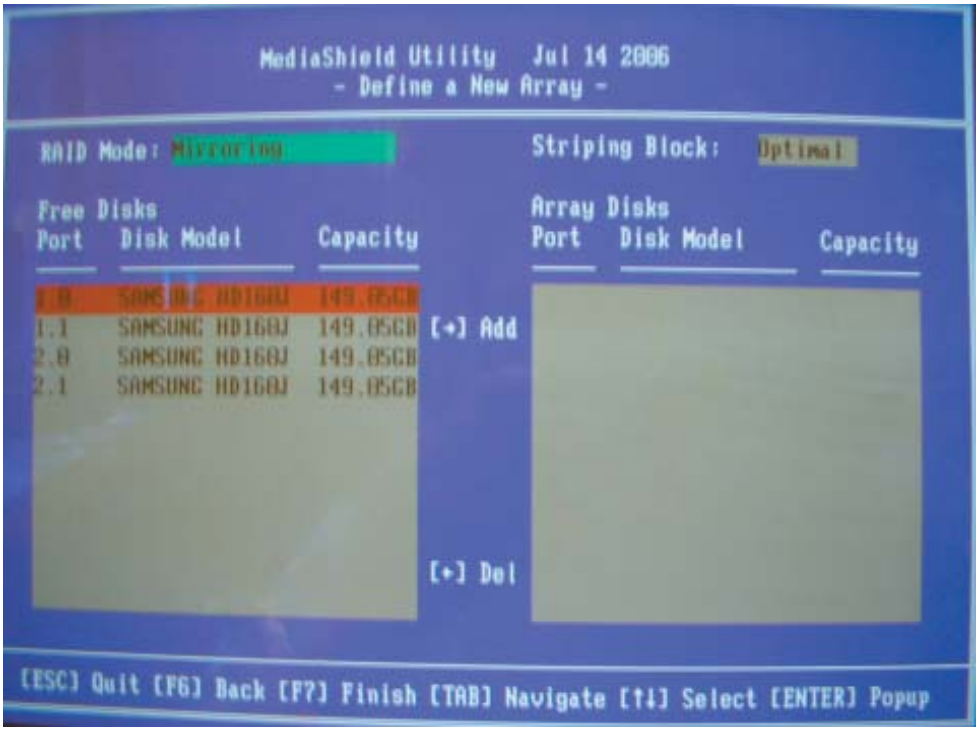
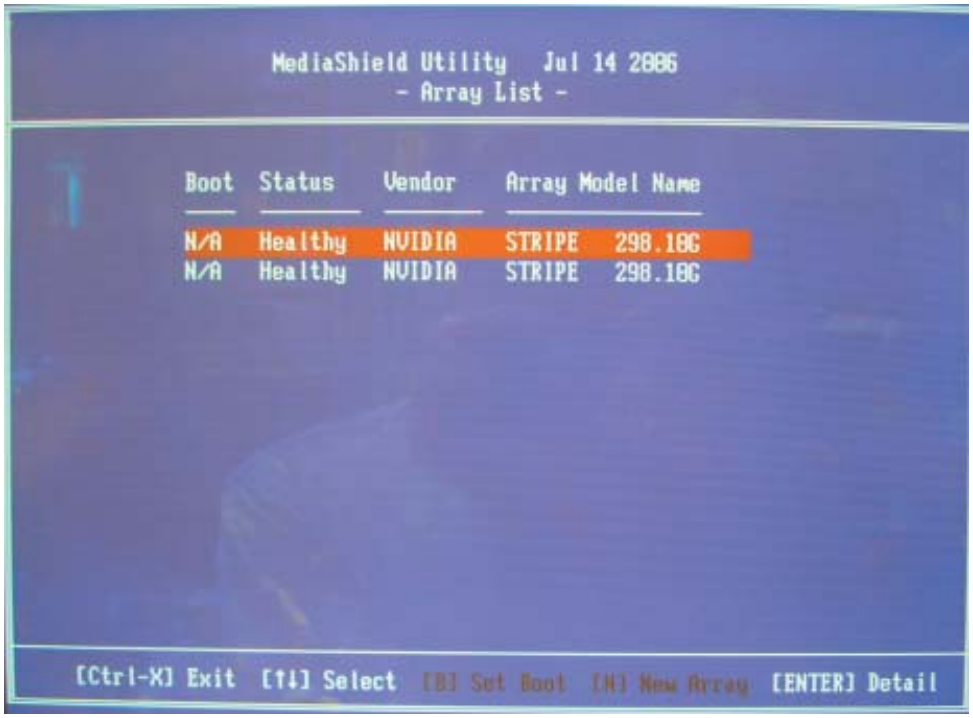

MediaShield Utility Jul 14 2006
- Define a New Array -
RAID Mode: Mirroring
Striping Block: Optimal
Free Disks
Port Disk Model Capacity
1.1 SAMSUNG HD160J 149.05GB
2.0 SAMSUNG HD160J 149.05GB
2.1 SAMSUNG HD160J 149.05GB
[+] Add
[+] Del
Array Disks
Port Disk Model Capacity
[ESC] Quit [F6] Back [F7] Finish [TAB] Navigate [↑↓] Select [ENTER] Popup

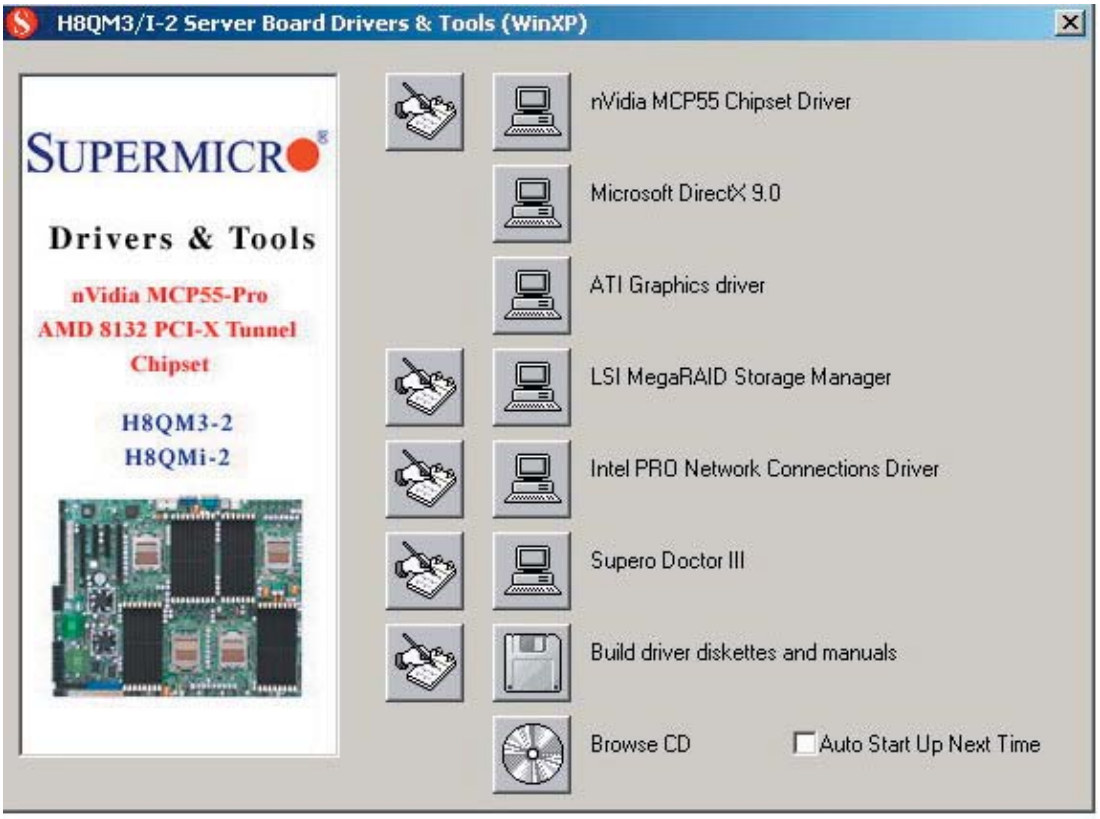
Figure 2-5. SATA RAID Utility: Array List


MediaShield Utility Jul 14 2006
- Array List -
Boot Status Vendor Array Model Name
N/A Healthy NVIDIA STRIPE 298.18G
N/A Healthy NVIDIA STRIPE 298.18G
[Ctrl-X] Exit [↑↓] Select [B] Set Boot [N] New Array [ENTER] Detail

2-11 Installing Software Drivers

After all the hardware and operating system have been installed, you need to install certain drivers. The necessary drivers are all included on the Supermicro CD that came packaged with your serverboard. After inserting this CD into your CD-ROM drive, the display shown in Figure 2-6 should appear. (If this display does not appear, click on the My Computer icon and then on the icon representing your CD-ROM drive. Finally, double click on the S "Setup" icon.)

Figure 2-6. Driver Installation Display Screen



Click the icons showing a hand writing on paper to view the readme files for each item. Click the tabs to the right of these *in order from top to bottom* to install each item one at a time. **After installing each item, you must reboot the system before moving on to the next item on the list.** You should install everything here except for the SUPER Doctor utility, which is optional. The bottom icon with a CD on it allows you to view the entire contents of the CD.

Chapter 3

Troubleshooting

3-1 Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the 'Technical Support Procedures' and/or 'Returning Merchandise for Service' section(s) in this chapter. Always disconnect the AC power cord before adding, changing or installing any hardware components.

Before Power On

Checklist

1. Check that the onboard power LED is lit (DP2 on the serverboard).
2. Make sure that the main ATX power connector at J1B1 and the 8-pin connectors at JPW1 and JPW2 are all connected to your power supply.
3. Make sure that no short circuits exist between the serverboard and chassis.
4. Disconnect all ribbon/wire cables from the serverboard, including those for the keyboard and mouse.
5. Remove all add-on cards.
6. Install CPUs and heatsinks (making sure they are fully seated) and connect the internal (chassis) speaker and the power LED to the serverboard. Check all jumper settings as well.
7. Use the correct type of onboard CMOS battery as recommended by the manufacturer. To avoid possible explosion, do not install the CMOS battery upside down.

No Power

Checklist

1. Make sure that no short circuits exist between the serverboard and the chassis.
2. Verify that all jumpers are set to their default positions.
3. Check that the 115V/230V switch on the power supply is properly set.
4. Turn the power switch on and off to test the system.
5. The battery on your serverboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

No Video

Checklist

1. If the power is on but you have no video, remove all the add-on cards and cables.
2. Use the speaker to determine if any beep codes exist. Refer to Appendix A for details on beep codes.

If you are a system integrator, VAR or OEM, the use of a POST diagnostics card is recommended. For I/O port 80h codes, refer to the Appendix.

Memory Errors

Checklist

1. Make sure that the DIMM modules are properly and fully installed.
2. You should be using registered ECC DDR-2 memory (see next page). Also, it is recommended that you use the same memory type and speed for all DIMMs in the system. See Section 2-4 for memory details and limitations.
3. Check for bad DIMM modules or slots by swapping modules between slots and noting the results.
4. 4. Check the power supply voltage 115V/230V switch.

Losing the System's Setup Configuration

Checklist

1. Make sure that you are using a high quality power supply. A poor quality power supply may cause the system to lose the CMOS setup information. Refer to Section 1-6 for details on recommended power supplies.

2. The battery on your serverboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

3. If the above steps do not fix the setup configuration problem, contact your vendor for repairs.

3-2 Technical Support Procedures

Before contacting Technical Support, please take the following steps. Also, note that as a serverboard manufacturer, we do not sell directly to end-users, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problem(s) with the specific system configuration that was sold to you.

1. Please review the 'Troubleshooting Procedures' and 'Frequently Asked Questions' (FAQs) sections in this chapter or see the FAQs on our web site before contacting Technical Support.

2. BIOS upgrades can be downloaded from our web site. **Note:** Not all BIOS can be flashed depending on the modifications to the boot block code.

3. If you still cannot resolve the problem, include the following information when contacting us for technical support:

- Serverboard model and PCB revision number

- BIOS release date/version (this can be seen on the initial display when your system first boots up)

- System configuration

Notes: An example of a Technical Support form is posted on our web site.

Distributors: For immediate assistance, please have your account number ready when contacting our technical support department by e-mail.

3-3 Frequently Asked Questions

Question: What type of memory does my serverboard support?

Answer: The H8QM3-2+/H8QMi-2+ supports up to 128 GB of registered ECC DDR2-667/533/400 SDRAM with four CPUs installed. In a dual-CPU configuration the maximum memory support is 64 GB and in a single-CPU configuration the maximum memory support is 32 GB. See Section 2-4 for details on installing memory.

Question: How do I update my BIOS?

Answer: It is recommended that you **not** upgrade your BIOS if you are not experiencing problems with your system. Updated BIOS files are located on our web site. Please check our BIOS warning message and the information on how to update your BIOS on our web site. Also, check the current BIOS revision and make sure it is newer than your current BIOS before downloading.

Select your serverboard model on the web page and download the corresponding BIOS file to your computer. Unzip the BIOS update file, in which you will find the readme.txt (flash instructions), the afudos.exe (BIOS flash utility) and the BIOS image (xxx.rom) files. Copy these files to a bootable floppy disk, insert the disk into drive A and reboot the system. At the DOS prompt after rebooting, enter the command "flash" (without quotation marks) then type in the BIOS file that you want to update with (xxxx.rom).

Question: What's on the CD that came with my serverboard?

Answer: The supplied compact disc has quite a few drivers and programs that will greatly enhance your system. We recommend that you review the CD and install the applications you need. Applications on the CD include chipset drivers for Windows and security and audio drivers.

Question: Why can't I turn off the power using the momentary power on/off switch?

Answer: The instant power off function is controlled in BIOS by the Power Button Mode setting. When the On/Off feature is enabled, the serverboard will have instant off capabilities as long as the BIOS has control of the system. When the Standby or Suspend feature is enabled or when the BIOS is not in control such as during memory count (the first screen that appears when the system is turned on), the momentary on/off switch must be held for more than four seconds to shut

down the system. This feature is required to implement the ACPI features on the serverboard.

Question: How do I connect the ATA133 cable to my IDE device(s)?

Answer: The 80-wire/40-pin high-density ATA133 IDE cable that came with your system has two connectors to support two drives. This special cable must be used to take advantage of the speed the ATA133 technology offers. **Connect the blue connector to the onboard IDE header and the other connector(s) to your hard drive(s).** Consult the documentation that came with your disk drive for details on actual jumper locations and settings.

3-4 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

For faster service, RMA authorizations may be requested online (http://www.supermicro.com/support/rma/).

The warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alteration, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

Notes

Chapter 4

BIOS

4-1 Introduction

This chapter describes the AMIBIOS™ Setup utility for the H8QM3-2+/H8QMi-2+. The AMI ROM BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the Manual Download area of our web site for any changes to BIOS that may not be reflected in this manual.

Starting the Setup Utility

To enter the BIOS Setup Utility, hit the <Delete> key while the system is booting-up. (In most cases, the <Delete> key is used to invoke the BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.) Each main BIOS menu option is described in this manual.

The Main BIOS screen has two main frames. The left frame displays all the options that can be configured. “Grayed-out” options cannot be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (Note that BIOS has default text messages built in. We retain the option to include, omit, or change any of these text messages.) Settings printed in **Bold** are the default values.

A "▶" indicates a submenu. Highlighting such an item and pressing the <Enter> key will open the list of settings within that submenu.

The BIOS setup utility uses a key-based navigation system called hot keys. Most of these hot keys (<F1>, <F10>, <Enter>, <ESC>, <Arrow> keys, etc.) can be used at any time during the setup navigation process.

4-2 Main Menu

When you first enter AMI BIOS Setup Utility, you will see the Main Menu screen. You can always return to the Main Menu by selecting the ***Main*** tab on the top of the screen with the arrow keys. The Main Menu screen provides you with a system overview, which includes the version, built date and ID of the AMIBIOS, the type, speed and number of the processors in the system and the amount of memory installed in the system.

System Time/System Date

You can edit this field to change the system time and date. Highlight *System Time* or *System Date* using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in DAY/MM/DD/YYYY format. The time is entered in HH:MM:SS format. Please note that time is in a 24-hour format. For example, 5:30 A.M. appears as 05:30:00 and 5:30 P.M. as 17:30:00.

4-3 Advanced Settings Menu

▶ BOOT Settings Configuration

Quick Boot

If Enabled, this option will skip certain tests during POST to reduce the time needed for the system to boot up. The options are **Enabled** and Disabled.

Quiet Boot

If **Disabled**, normal POST messages will be displayed on boot-up. If Enabled, this display the OEM logo instead of POST messages.

Add-On ROM Display Mode

Set this option to display add-on ROM (read-only memory) messages. The default setting is **Force BIOS**. Select Force BIOS to allow the computer system to force a third party BIOS to display during system boot. Select Keep Current to allow the computer system to display the BIOS information during system boot. The options are **Force BIOS** and Keep Current.

Boot up Num-Lock

Set this value to allow the Number Lock setting to be modified during boot up. The options are **On** and Off.

PS/2 Mouse Support

Set this value to modify support for a PS/2 mouse. The options are **Auto**, Enabled and Disabled.

Wait for 'F1' If Error

Select Enable to activate the Wait for F1 if Error function. The options are **Enabled** and Disabled.

Hit 'DEL' Message Display

Select Enabled to display message to hit the DEL key to enter Setup. The options are **Enabled** and Disabled.

Interrupt 19 Capture

Select Enabled to allow ROMs to trap Interrupt 19. The options are **Enabled** and Disabled.

OS Installation

Change this setting if using a 64-bit Linux operating system. The available options are **Other** and Linux.

ACPI Configuration:

ACPI Version Features

Use this setting the determine which ACPI version to use. Options are **ACPI v1.0**, ACPI v2.0 and ACPI v3.0.

ACPI APIC Support

Determines whether to include the ACPI APIC table pointer in the RSDT pointer list. The available options are **Enabled** and Disabled.

ACPI OEMB Table

Determines whether to include the ACPI APIC table pointer in the RSDT pointer list. The available options are **Enabled** and Disabled.

Headless Mode

Use this setting to Enable or **Disable** headless operation mode through ACPI.

MCP55 ACPI HPET Table

Use this setting to either **Enable** or Disable the MCP55 ACPI HPET table.

Power Configuration:

Power Button Mode

Allows the user to change the function of the power button. Options are **On/Off** and Suspend.

Restore on AC Power Loss

This setting allows you to choose how the system will react when power returns after an unexpected loss of power. The options are Power Off, Power On and **Last State**.

Watch Dog Timer

This setting is used to Enable or **Disable** the Watch Dog Timer function. It must be used in conjunction with the Watch Dog jumper (see Chapter 2 for details).

MPS Configuration

MPS Revision

This setting allows the user to select the MPS revision level. The options are 1.1 and **1.4.**

Smbios Configuration

Smbios Smi Support

This setting allows SMI wrapper support for PnP function 50h-54h. The options are **Enabled** and Disabled**.**

▶ CPU Configuration

This submenu lists CPU information and contains the following settings:

GART Error Reporting
This setting is used for testing only.

Power Now
This setting is used to Enable or **Disable** the AMD Power Now feature.

Thermal Throttling
This setting is used to Enable or **Disable** Thermal Throttling.

Microcode Update
This setting is used to **Enable** or Disable microcode updates for Virtual Machine.

SVM uCode Option
This setting is used to **Enable** or Disable processor-assisted virtualization.

Power Now
This setting is used to Enable or **Disable** the AMD Power Now feature.

Thermal Throttling
This setting is used to Enable or **Disable** Thermal Throttling.

▶ Floppy/IDE/SATA Configuration

Floppy A
Move the cursor to these fields via up and down <arrow> keys to select the floppy type. The options are Disabled, 360 KB 5 1/4", 1.2 MB 5 1/4", 720 KB 3½", **1.44 MB 3½"**, and 2.88 MB 3½".

Floppy B
Move the cursor to these fields via up and down <arrow> keys to select the floppy type. The options are Disabled, 360 KB 5 1/4", 1.2 MB 5 1/4", 720 KB 3½", **1.44 MB 3½"**, and 2.88 MB 3½".

Onboard Floppy Controller
Use this setting to **Enable** or Disable the onboard floppy controller.

Onboard IDE Controller
There is a single floppy controller on the motherboard, which may be **Enabled** or Disabled with this setting.

Serial ATA Devices
This setting is used to determine if SATA drives will be used and how many. Options are Disabled, Device 0, Device 0/1 and **Device 0/1/2**.

nVidia RAID Function
This setting is used to Enable or **Disable** the nVidia ROM. If Enabled, the setting below will appear.

Primary IDE Master/Slave
Highlight one of the items above and press <Enter> to access the submenu for that item.

Type
Select the type of device connected to the system. The options are Not Installed, **Auto**, CDROM and ARMD.

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. The options are Disabled and **Auto**.

Block (Multi-Sector Transfer)

Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt. Select Disabled to allow the data to be transferred from and to the device one sector at a time. Select **Auto** to allows the data transfer from and to the device occur multiple sectors at a time if the device supports it.

PIO Mode

PIO (Programmable I/O) mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The options are **Auto**, 0, 1, 2, 3, and 4. Select Auto to allow AMI BIOS to auto detect the PIO mode. Use this value if the IDE disk drive support cannot be determined. Select 0 to allow AMI BIOS to use PIO mode 0. It has a data transfer rate of 3.3 MBs. Select 1 to allow AMI BIOS to use PIO mode 1. It has a data transfer rate of 5.2 MBs. Select 2 to allow AMI BIOS to use PIO mode 2. It has a data transfer rate of 8.3 MBs. Select 3 to allow AMI BIOS to use PIO mode 3. It has a data transfer rate of 11.1 MBs. Select 4 to allow AMI BIOS to use PIO mode 4. It has a data transfer rate of 16.6 MBs. This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.

DMA Mode

Selects the DMA Mode. Options are SWDMA0, SWDMA1, SWDMA2, MWDMA0. MDWDMA1, MWDMA2, UDMA0. UDMA1, UDMA2, UDMA3, UDMA4 and UDMA5. (SWDMA=Single Word DMA, MWDMA=Multi Word DMA, UDMA=UltraDMA.)

S.M.A.R.T.

Self-Monitoring Analysis and Reporting Technology (SMART) can help predict impending drive failures. Select "Auto" to allow BIOS to auto detect hard disk drive support. Select "Disabled" to prevent AMI BIOS from using the S.M.A.R.T. Select "Enabled" to allow AMI BIOS to use the S.M.A.R.T. to support hard drive disk. The options are Disabled, Enabled, and **Auto**.

32-Bit Data Transfer

Select "Enabled" to activate the function of 32-Bit data transfer. Select "Disabled" to deactivate the function. The options are Enabled and **Disabled**.

Serial ATA0/1/2 Primary/Secondary Channel

Highlight one of the items above and press <Enter> to access the submenu for that item. If a drive is present, information on that drive will be displayed here.

Type

Select the type of device connected to the system. The options are Not Installed, **Auto**, CDROM and ARMD.

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. The options are Disabled and **Auto**.

Block (Multi-Sector Transfer)

Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt. Select Disabled to allow the data to be transferred from and to the device one sector at a time. Select **Auto** to allows the data transfer from and to the device occur multiple sectors at a time if the device supports it.

PIO Mode

PIO (Programmable I/O) mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The options are **Auto**, 0, 1, 2, 3, and 4. Select Auto to allow AMI BIOS to auto detect the PIO mode. Use this value if the IDE disk drive support cannot be determined. Select 0 to allow AMI BIOS to use PIO mode 0. It has a data transfer rate of 3.3 MBs. Select 1 to allow AMI BIOS to use PIO mode 1. It has a data transfer rate of 5.2 MBs. Select 2 to allow AMI BIOS to use PIO mode 2. It has a data transfer rate of 8.3 MBs. Select 3 to allow AMI BIOS to use PIO mode 3. It has a data transfer rate of 11.1 MBs. Select 4 to allow AMI BIOS to use PIO mode 4. It has a data transfer rate of 16.6 MBs. This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.

DMA Mode

Selects the DMA Mode. Options are SWDMA0, SWDMA1, SWDMA2, MWD-MA0. MDWDMA1, MWDMA2, UDMA0. UDMA1, UDMA2, UDMA3, UDMA4 and UDMA5. (SWDMA=Single Word DMA, MWDMA=Multi Word DMA, UDMA=UltraDMA.)

S.M.A.R.T.

Self-Monitoring Analysis and Reporting Technology (SMART) can help predict impending drive failures. Select "Auto" to allow BIOS to auto detect hard disk drive support. Select "Disabled" to prevent AMI BIOS from using the S.M.A.R.T. Select "Enabled" to allow AMI BIOS to use the S.M.A.R.T. to support hard drive disk. The options are Disabled, Enabled, and **Auto**.

32-Bit Data Transfer

Select "Enabled" to activate the function of 32-Bit data transfer. Select "Disabled" to deactivate the function. The options are Enabled and **Disabled**.

Hard Disk Write Protect

Select Enabled to enable the function of Hard Disk Write Protect to prevent data from being written to HDD. The options are Enabled or **Disabled**.

IDE Detect Time Out (Sec)

This feature allows the user to set the time-out value for detecting ATA, ATAPI devices installed in the system. Options are 0 (sec), 5, 10, 15, 20, 25, 30 and **35**.

ATA(PI) 80Pin Cable Detection

This setting allows AMI BIOS to auto-detect the 80-Pin ATA(PI) cable. The options are Host, Device and **Host & Device**.

▶ PCI/PnP Configuration

Clear NVRAM

Select Yes to clear NVRAM during boot-up. The options are Yes and **No**.

Plug & Play OS

Select Yes to allow the OS to configure Plug & Play devices. (This is not required for system boot if your system has an OS that supports Plug & Play.) Select **No** to allow AMIBIOS to configure all devices in the system.

PCI Latency Timer

This option sets the latency of all PCI devices on the PCI bus. Select a value to set the PCI latency in PCI clock cycles. Options are 32, **64**, 96, 128, 160, 192, 224 and 248.

Allocate IRQ to PCI VGA

Set this value to allow or restrict the system from giving the VGA adapter card an interrupt address. The options are **Yes** and No.

Palette Snooping

Select "Enabled" to inform the PCI devices that an ISA graphics device is installed in the system in order for the graphics card to function properly. The options are Enabled and **Disabled**.

PCI IDE BusMaster

Set this value to allow or prevent the use of PCI IDE busmastering. Select "Enabled" to allow AMI BIOS to use PCI busmaster for reading and writing to IDE drives. The options are **Disabled** and Enabled.

Offboard PCI/ISA IDE Card

This option allows the user to assign a PCI slot number to an Off-board PCI/ISA IDE card in order for it to function properly. The options are **Auto**, PCI Slot1, PCI Slot2, PCI Slot3, PCI Slot4, PCI Slot5, and PCI Slot6.

IRQ3/IRQ4/IRQ5/IRQ7/IRQ9/IRQ10/IRQ11/IRQ14/IRQ15
This feature specifies the availability of an IRQ to be used by a PCI/PnP device. Select Reserved for the IRQ to be used by a Legacy ISA device. The options are **Available** and Reserved.

DMA Channel 0/Channel 1/Channel 3/Channel 5/Channel 6/Channel 7
Select Available to indicate that a specific DMA channel is available to be used by a PCI/PnP device. Select Reserved if the DMA channel specified is reserved for a Legacy ISA device. The options are **Available** and Reserved.

Reserved Memory Size
You may set reserved memory with this setting. The options are **Disabled**, 16k, 32k and 64k.

Onboard SATA Controller
Use this setting to Enable or **Disable** the onboard SATA controller.

▶ Super IO Configuration

Serial Port1 Address
This option specifies the base I/O port address and Interrupt Request address of serial port 1. Select "Disabled" to prevent the serial port from accessing any system resources. When this option is set to *Disabled*, the serial port physically becomes unavailable. Select "3F8/IRQ4" to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. The options are Disabled, **3F8/IRQ4**, 3E8/IRQ4 and 2E8/IRQ3.

Serial Port2 Address
This option specifies the base I/O port address and Interrupt Request address of serial port 2. Select "Disabled" to prevent the serial port from accessing any system resources. When this option is set to "Disabled", the serial port physically becomes unavailable. Select "2F8/IRQ3" to allow the serial port to use 2F8 as its I/O port address and IRQ 3 for the interrupt address. The options are Disabled, **2F8/IRQ3**, 3E8/IRQ4 and 2E8/IRQ3.

Serial Port 2 Mode
Tells BIOS which mode to select for serial port 2. The options are **Normal**, IrDA and ASKIR.

▶ Chipset Configuration

▶ NorthBridge Configuration

▶ Memory Configuration

Memclock Mode
This setting determines how the memory clock is set. **Auto** has the memory clock by code and Limit allows the user to set a standard value.

MCT Timing Mode
Sets the timing mode for memory. Options are **Auto** and Manual.

Bank Interleaving
Select Auto to automatically enable interleaving-memory scheme when this function is supported by the processor. The options are **Auto** and Disabled.

Enable Clock to All DIMMs
Use this setting to enable unused clocks to all DIMMs, even if some DIMM slots are unpopulated. Options are Enabled and **Disabled**.

Mem Clk Tristate C3/ALTVID
Use this setting to Enable or **Disable** memory clock tristate during C3 and ALT VID.

CS Sparing Enable
Use this setting to Enable or **Disable** the CS Sparing function.

DQS Signal Training Control
Disabling this setting will require custom memory timing programming. This setting is automatically disabled if CS Sparing is enabled. Options are **Enabled** and Disabled.

Memory Hole Remapping
When "Enabled", this feature enables hardware memory remapping around the memory hole. Options are **Enabled** and Disabled.

▶ ECC Configuration

DRAM ECC Enable

DRAM ECC allows hardware to report and correct memory errors automatically. Options are **Enabled** and Disabled.

4-Bit ECC Mode
Allows the user to enabled 4-bit ECC mode (also known as ECC Chipkill). Options are Enabled and **Disabled**.

DRAM Scrub Redirect
Allows system to correct DRAM ECC errors immediately, even with background scrubbing on. Options are Enabled and **Disabled**.

DRAM BG Scrub
Corrects memory errors so later reads are correct. Options are **Disabled** and various times in nanoseconds and microseconds.

L2 Cache BG Scrub
Allows L2 cache RAM to be corrected when idle. Options are **Disabled** and various times in nanoseconds and microseconds.

Data Cache BG Scrub
Allows L1 cache RAM to be corrected when idle. Options are **Disabled** and various times in nanoseconds and microseconds.

Power Down Control
Allows DIMMs to enter power down mode by deasserting the clock enable signal when DIMMs are not in use. Options are **Auto** and Disabled.

Alternate VID
Specifies and alternate VID while in low power states. Options are **Auto** and various voltages between .8V and 1.115V.

Memory Timing Parameters
Allows the user to select which CPU Node's timing parameters (memory clock, etc.) to display. Options are **CPU Node 0,** CPU Node 1, CPU Node 2 and CPU Node 3.

▶ SouthBridge/MCP55 Configuration

CPU/LDT Spread Spectrum
Enables spread spectrum for the CPU/LDT. Options are **Center Spread**, Down Spread or Disabled.

PCIE Spread Spectrum
Allows you to **Enable** or Disable spread spectrum for PCI-Express.

SATA Spread Spectrum
Enables spread spectrum for the SATA. Options are **Enabled** and Disabled.

Primary Graphics Adapter
Options are **PCI Express** → **PCI** and PCI → PCI Express.

USB 1.1 Controller
Enable or disable the USB 1.1 controller.

USB 2.0 Controller
Enable or disable the USB 2.0 controller.

USB Devices Enabled
This field dsiplays the USB devices currently enabled.

Legacy USB Support
Select "Enabled" to enable the support for USB Legacy. Disable Legacy support if there are no USB devices installed in the system. "Auto" disabled Legacy support if no USB devices are connected. The options are Disabled, **Enabled** and Auto.

USB 2.0 Controller Mode
Select the controller mode for your USB ports. Options are **HiSpeed** and FullSpeed. (HiSpeed=480 Mbps, FullSpeed=12 Mbps**)**.

BIOS EHCI Hand-Off
Enable or Disable a workaround for OS's without EHCI hand-off support.

▶ Event Log Configuration

View Event Log
Highlight this item and press <Enter> to view the contents of the event log.

Mark All Events as Read
Highlight this item and press <Enter> to mark all events as read.

Clear Event Log
Select Yes and press <Enter> to clear all event logs. The options are Yes and No to verify.

▶ PCI Express Configuration

Active State Power Management
Used to Enable or **Disable** the PCI L0 and L1 link power states.

▶ Remote Access Configuration

Remote Access
Allows you to Enable or **Disable** remote access. If enabled, the settings below will appear.

Serial Port Number
Selects the serial port to use for console redirection. Options are **COM1** and COM2.

Serial Port Mode
Selects the serial port settings to use. Options are **(115200 8, n, 1)**, (57600 8, n, 1), (38400 8, n, 1), (19200 8, n, 1) and (09600 8, n, 1).

Flow Control
Selects the flow control to be used for console redirection. Options are **None,** Hardware and Software.

Redirection After BIOS POST
Options are Disable (no redirection after BIOS POST), Boot Loader (redirection during POST and during boot loader) and **Always** (redirection always active). Note that some OS's may not work with this set to Always.

Terminal Type
Selects the type of the target terminal: **ANSI**, VT100 and VT-UTF8.

VT-UTF8 Combo Key Support

Allows you to **Enable** or Disable VT-UTF8 combination key support for ANSI/ VT100 terminals.

Sredir Memory Display Delay

Use this setting to set the delay in seconds to display memory information. Options are **No Delay**, 1 sec, 2 secs and 4 secs.

▶ System Health Monitor

CPU Overheat Temperature

Use the "+" and "-" keys to set the CPU temperature threshold to between 65° and 90° C. When this threshold is exceeded, the overheat LED on the chassis will light up and an alarm will sound. The LED and alarm will turn off once the CPU temperature has dropped to 5 degrees below the threshold set. The default setting is **72° C**.

Other items in the submenu are systems monitor displays for the following information: CPU1 Temperature, CPU2 Temperature, CPU3 Temperature, CPU4 Temperature, (for 4U systems), System Temperature, CPU1 Vcore, CPU2 Vcore, CPU3 Vcore, CPU4 Vcore (for 4U systems), 3.3V Vcc, +5Vin, +12Vin, 5V standby and battery voltage.

▶ System Fan Monitor

Fan Speed Control

This feature allows the user to determine how the system will control the speed of the onboard fans. Select "Workstation" if your system is used as a Workstation. Select "Server" if your system is used as a Server. Select "Disable" to disable the fan speed control function to allow the onboard fans to continuously run at full speed (12V). The options are **1) Disabled (Full Speed)** 2) Optimized for Server and 3) Optimized for Workstation.

FAN1 Speed through FAN9 Speed

The speeds of the onboard fans (in rpm) are displayed here.

4-4 Boot Menu

This feature allows the user to configure the following items:

▶ Boot Device Priority

This feature allows the user to prioritize the boot sequence from the available devices. The devices to set are:

- · 1st Boot Device
- · 2nd Boot Device
- · 3rd Boot Device
- · 4th Boot Device

▶ Hard Disk Drives

This feature allows the user to specify the boot sequence from available hard disk drives.

1st Drive

Specifies the boot sequence for the 1st Hard Drive.

▶ Hard Disk Drives

This feature allows the user to specify the Boot sequence from available hard disk drives.

▶ Removable Drives

This feature allows the user to specify the Boot sequence from available removable drives.

1st Drive

Specifies the boot sequence for the 1st Removable Drive. The options are **1st Floppy Drive** and Disabled.

4-5 Security Menu

AMI BIOS provides a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.

Change Supervisor Password
Select this option and press <Enter> to access the sub menu, and then type in the password.

Change User Password
Select this option and press <Enter> to access the sub menu, and then type in the password.

Boot Sector Virus Protection
This option is near the bottom of the Security Setup screen. Select "Disabled" to deactivate the Boot Sector Virus Protection. Select "Enabled" to enable boot sector protection. When "Enabled", AMI BIOS displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The options are Enabled and **Disabled**.

4-6 Exit Menu

Select the Exit tab from AMI BIOS Setup Utility screen to enter the Exit BIOS Setup screen.

Save Changes and Exit

When you have completed the system configuration changes, select this option to leave BIOS Setup and reboot the computer, so the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

Discard Changes and Exit

Select this option to quit BIOS Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

Discard Changes

Select this option and press <Enter> to discard all the changes and return to AMI BIOS Utility Program.

Load Optimal Defaults

To set this feature, select Load Optimal Defaults from the Exit menu and press <Enter>. Then Select "OK" to allow BIOS to automatically load the Optimal Defaults as the BIOS Settings. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications.

Load Fail-Safe Defaults

To set this feature, select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The Fail-Safe settings are designed for maximum system stability, but not maximum performance.

Appendix A

BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

Fatal errors are those which will not allow the system to continue the boot-up procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list, on the following page, correspond to the number of beeps for the corresponding error. All errors listed, with the exception of Beep Code 8, are fatal errors.

POST codes may be read on the debug LEDs located beside the LAN port on the serverboard backplane. See the description of the Debug LEDs (LED1 and LED2) in Chapter 5.

A-1 AMIBIOS Error Beep Codes

Beep Code	Error Message	Description
1 beep	Refresh	Circuits have been reset (ready to power up)
5 short, 1 long	Memory Error	No memory detected in system
8 beeps	Display memory read/write error	Video adapter missing or with faulty memory

Notes

Appendix B

BIOS POST Checkpoint Codes

When AMIBIOS performs the Power On Self Test, it writes checkpoint codes to I/O port 0080h. If the computer cannot complete the boot process, diagnostic equipment can be attached to the computer to read I/O port 0080h.

B-1 Uncompressed Initialization Codes

The uncompressed initialization checkpoint codes are listed in order of execution:

Checkpoint	Code Description
D0h	The NMI is disabled. Power on delay is starting. Next, the initialization code checksum will be verified.
D1h	Initializing the DMA controller, performing the keyboard controller BAT test, starting memory refresh and entering 4 GB flat mode next.
D3h	Starting memory sizing next.
D4h	Returning to real mode. Executing any OEM patches and setting the Stack next.
D5h	Passing control to the uncompressed code in shadow RAM at E000:0000h. The initialization code is copied to segment 0 and control will be transferred to segment 0.
D6h	Control is in segment 0. Next, checking if <Ctrl> <Home> was pressed and verifying the system BIOS checksum. If either <Ctrl> <Home> was pressed or the system BIOS checksum is bad, next will go to checkpoint code E0h. Otherwise, going to checkpoint code D7h.

B-2 Bootblock Recovery Codes

The bootblock recovery checkpoint codes are listed in order of execution:

Checkpoint	Code Description
E0h	The onboard floppy controller if available is initialized. Next, beginning the base 512 KB memory test.
E1h	Initializing the interrupt vector table next.
E2h	Initializing the DMA and Interrupt controllers next.
E6h	Enabling the floppy drive controller and Timer IRQs. Enabling internal cache memory.
Edh	Initializing the floppy drive.
Eeh	Looking for a floppy diskette in drive A:. Reading the first sector of the diskette.
Efh	A read error occurred while reading the floppy drive in drive A:.
F0h	Next, searching for the AMIBOOT.ROM file in the root directory.
F1h	The AMIBOOT.ROM file is not in the root directory.
F2h	Next, reading and analyzing the floppy diskette FAT to find the clusters occupied by the AMIBOOT.ROM file.
F3h	Next, reading the AMIBOOT.ROM file, cluster by cluster.
F4h	The AMIBOOT.ROM file is not the correct size.
F5h	Next, disabling internal cache memory.
FBh	Next, detecting the type of flash ROM.
FCh	Next, erasing the flash ROM.
FDh	Next, programming the flash ROM.
FFh	Flash ROM programming was successful. Next, restarting the system BIOS.

B-3 Uncompressed Initialization Codes

The following runtime checkpoint codes are listed in order of execution.

These codes are uncompressed in F0000h shadow RAM.

Checkpoint	Code Description
03h	The NMI is disabled. Next, checking for a soft reset or a power on condition.
05h	The BIOS stack has been built. Next, disabling cache memory.
06h	Uncompressing the POST code next.
07h	Next, initializing the CPU and the CPU data area.
08h	The CMOS checksum calculation is done next.
0Ah	The CMOS checksum calculation is done. Initializing the CMOS status register for date and time next.
0Bh	The CMOS status register is initialized. Next, performing any required initialization before the keyboard BAT command is issued.
0Ch	The keyboard controller input buffer is free. Next, issuing the BAT command to the keyboard controller.
0Eh	The keyboard controller BAT command result has been verified. Next, performing any necessary initialization after the keyboard controller BAT command test.
0Fh	The initialization after the keyboard controller BAT command test is done. The keyboard command byte is written next.
10h	The keyboard controller command byte is written. Next, issuing the Pin 23 and 24 blocking and unblocking command.
11h	Next, checking if <End or <Ins> keys were pressed during power on. Initializing CMOS RAM if the Initialize CMOS RAM in every boot AMIBIOS POST option was set in AMIBCP or the <End> key was pressed.
12h	Next, disabling DMA controllers 1 and 2 and interrupt controllers 1 and 2.
13h	The video display has been disabled. Port B has been initialized. Next, initializing the chipset.
14h	The 8254 timer test will begin next.
19h	Next, programming the flash ROM.
1Ah	The memory refresh line is toggling. Checking the 15 second on/off time next.
2Bh	Passing control to the video ROM to perform any required configuration before the video ROM test.
2Ch	All necessary processing before passing control to the video ROM is done. Looking for the video ROM next and passing control to it.
2Dh	The video ROM has returned control to BIOS POST. Performing any required processing after the video ROM had control
23h	Reading the 8042 input port and disabling the MEGAKEY Green PC feature next. Making the BIOS code segment writable and performing any necessary configuration before initializing the interrupt vectors.
24h	The configuration required before interrupt vector initialization has completed. Interrupt vector initialization is about to begin.

Checkpoint	Code Description
25h	Interrupt vector initialization is done. Clearing the password if the POST DIAG switch is on.
27h	Any initialization before setting video mode will be done next.
28h	Initialization before setting the video mode is complete. Configuring the monochrome mode and color mode settings next.
2Ah	Bus initialization system, static, output devices will be done next, if present. See the last page for additional information.
2Eh	Completed post-video ROM test processing. If the EGA/VGA controller is not found, performing the display memory read/write test next.
2Fh	The EGA/VGA controller was not found. The display memory read/write test is about to begin.
30h	The display memory read/write test passed. Look for retrace checking next.
31h	The display memory read/write test or retrace checking failed. Performing the alternate display memory read/write test next.
32h	The alternate display memory read/write test passed. Looking for alternate display retrace checking next.
34h	Video display checking is over. Setting the display mode next.
37h	The display mode is set. Displaying the power on message next.
38h	Initializing the bus input, IPL, general devices next, if present. See the last page of this chapter for additional information.
39h	Displaying bus initialization error messages. See the last page of this chapter for additional information.
3Ah	The new cursor position has been read and saved. Displaying the Hit <DEL> message next.
3Bh	The Hit <DEL> message is displayed. The protected mode memory test is about to start.
40h	Preparing the descriptor tables next.
42h	The descriptor tables are prepared. Entering protected mode for the memory test next.
43h	Entered protected mode. Enabling interrupts for diagnostics mode next.
44h	Interrupts enabled if the diagnostics switch is on. Initializing data to check memory wraparound at 0:0 next.
45h	Data initialized. Checking for memory wraparound at 0:0 and finding the total system memory size next.
46h	The memory wraparound test is done. Memory size calculation has been done. Writing patterns to test memory next.
47h	The memory pattern has been written to extended memory. Writing patterns to the base 640 KB memory next.
48h	Patterns written in base memory. Determining the amount of memory below 1 MB next.
49h	The amount of memory below 1 MB has been found and verified.
4Bh	The amount of memory above 1 MB has been found and verified. Checking for a soft reset and clearing the memory below 1 MB for the soft reset next. If this is a power on situation, going to checkpoint 4Eh next.

Checkpoint	Code Description
4Ch	The memory below 1 MB has been cleared via a soft reset. Clearing the memory above 1 MB next.
4Dh	The memory above 1 MB has been cleared via a soft reset. Saving the memory size next. Going to checkpoint 52h next.
4Eh	The memory test started, but not as the result of a soft reset. Displaying the first 64 KB memory size next.
4Fh	The memory size display has started. The display is updated during the memory test. Performing the sequential and random memory test next.
50h	The memory below 1 MB has been tested and initialized. Adjusting the displayed memory size for relocation and shadowing next.
51h	The memory size display was adjusted for relocation and shadowing.
52h	The memory above 1 MB has been tested and initialized. Saving the memory size information next.
53h	The memory size information and the CPU registers are saved. Entering real mode next.
54h	Shutdown was successful. The CPU is in real mode. Disabling the Gate A20 line, parity, and the NMI next.
57h	The A20 address line, parity, and the NMI are disabled. Adjusting the memory size depending on relocation and shadowing next.
58h	The memory size was adjusted for relocation and shadowing. Clearing the Hit <DEL> message next.
59h	The Hit <DEL> message is cleared. The <WAIT...> message is displayed. Starting the DMA and interrupt controller test next.
60h	The DMA page register test passed. Performing the DMA Controller 1 base register test next.
62h	The DMA controller 1 base register test passed. Performing the DMA controller 2 base register test next.
65h	The DMA controller 2 base register test passed. Programming DMA controllers 1 and 2 next.
66h	Completed programming DMA controllers 1 and 2. Initializing the 8259 interrupt controller next.
67h	Completed 8259 interrupt controller initialization.
7Fh	Extended NMI source enabling is in progress.
80h	The keyboard test has started. Clearing the output buffer and checking for stuck keys. Issuing the keyboard reset command next.
81h	A keyboard reset error or stuck key was found. Issuing the keyboard controller interface test command next.
82h	The keyboard controller interface test completed. Writing the command byte and initializing the circular buffer next.
83h	The command byte was written and global data initialization has completed. Checking for a locked key next.
84h	Locked key checking is over. Checking for a memory size mismatch with CMOS RAM data next.
85h	The memory size check is done. Displaying a soft error and checking for a password or bypassing WINBIOS Setup next.

Checkpoint	Code Description
86h	The password was checked. Performing any required programming before WINBIOS Setup next.
87h	The programming before WINBIOS Setup has completed. Uncompressing the WINBIOS Setup code and executing the AMIBIOS Setup or WINBIOS Setup utility next.
88h	Returned from WINBIOS Setup and cleared the screen. Performing any necessary programming after WINBIOS Setup next.
89h	The programming after WINBIOS Setup has completed. Displaying the power on screen message next.
8Ch	Programming the WINBIOS Setup options next.
8Dh	The WINBIOS Setup options are programmed. Resetting the hard disk controller next.
8Fh	The hard disk controller has been reset. Configuring the floppy drive controller next.
91h	The floppy drive controller has been configured. Configuring the hard disk drive controller next.
95h	Initializing the bus option ROMs from C800 next. See the last page of this chapter for additional information.
96h	Initializing before passing control to the adaptor ROM at C800.
97h	Initialization before the C800 adaptor ROM gains control has completed. The adaptor ROM check is next.
98h	The adaptor ROM had control and has now returned control to BIOS POST. Performing any required processing after the option ROM returned control.
99h	Any initialization required after the option ROM test has completed. Configuring the timer data area and printer base address next.
9Ah	Set the timer and printer base addresses. Setting the RS-232 base address next.
9Bh	Returned after setting the RS-232 base address. Performing any required initialization before the Coprocessor test next.
9Ch	Required initialization before the Coprocessor test is over. Initializing the Coprocessor next.
9Dh	Coprocessor initialized. Performing any required initialization after the Coprocessor test next.
9Eh	Initialization after the Coprocessor test is complete. Checking the extended keyboard, keyboard ID, and Num Lock key next. Issuing the keyboard ID command next.
A2h	Displaying any soft errors next.
A3h	The soft error display has completed. Setting the keyboard typematic rate next.
A4h	The keyboard typematic rate is set. Programming the memory wait states next.
A5h	Memory wait state programming is over. Clearing the screen and enabling parity and the NMI next.
A7h	NMI and parity enabled. Performing any initialization required before passing control to the adaptor ROM at E000 next.
A8h	Initialization before passing control to the adaptor ROM at E000h completed. Passing control to the adaptor ROM at E000h next.

Checkpoint	Code Description
A9h	Returned from adaptor ROM at E000h control. Performing any initialization required after the E000 option ROM had control next.
Aah	Initialization after E000 option ROM control has completed. Displaying the system configuration next.
Abh	Uncompressing the DMI data and executing DMI POST initialization next.
B0h	The system configuration is displayed.
B1h	Copying any code to specific areas.
00h	Code copying to specific areas is done. Passing control to INT 19h boot loader next.

Notes